

## Factoring: All Techniques Combined (Hard)

Date\_\_\_\_\_ Period\_\_\_\_

**Factor each.**

1)  $x^3 - 5x^2 - x + 5$

2)  $x^4 - 2x^2 - 15$

3)  $x^6 - 26x^3 - 27$

4)  $x^6 + 2x^4 - 16x^2 - 32$

5)  $x^4 - 13x^2 + 40$

6)  $x^9 - x^6 - x^3 + 1$

7)  $x^6 - 4x^2$

8)  $x^4 + 14x^2 + 45$

9)  $2x^4 + x^2 - 6$

10)  $2x^2 - 13x + 20$

11)  $4x^3 - x^2 - 4x + 1$

12)  $4x^8 - 61x^4 + 225$

13)  $5x^2 + 24x - 5$

14)  $5x^2 + 29x + 20$

15)  $4x^2 + 4x - 15$

16)  $10x^3 - 8x^2 + 25x - 20$

17)  $27x^9 + x^6 - 27x^3 - 1$

18)  $8x^4 + 10x^2 - 3$

## Factoring: All Techniques Combined (Hard)

Date\_\_\_\_\_ Period\_\_\_\_

**Factor each.**

1)  $x^3 - 5x^2 - x + 5$

$$(x - 5)(x + 1)(x - 1)$$

2)  $x^4 - 2x^2 - 15$

$$(x^2 - 5)(x^2 + 3)$$

3)  $x^6 - 26x^3 - 27$

$$(x - 3)(x^2 + 3x + 9)(x + 1)(x^2 - x + 1)$$

4)  $x^6 + 2x^4 - 16x^2 - 32$

$$(x^2 + 2)(x^2 + 4)(x + 2)(x - 2)$$

5)  $x^4 - 13x^2 + 40$

$$(x^2 - 5)(x^2 - 8)$$

6)  $x^9 - x^6 - x^3 + 1$

$$(x - 1)^2(x^2 + x + 1)^2(x + 1)(x^2 - x + 1)$$

7)  $x^6 - 4x^2$

$$x^2(x^2 - 2)(x^2 + 2)$$

8)  $x^4 + 14x^2 + 45$

$$(x^2 + 5)(x^2 + 9)$$

$$9) 2x^4 + x^2 - 6$$

$$(2x^2 - 3)(x^2 + 2)$$

$$10) 2x^2 - 13x + 20$$

$$(2x - 5)(x - 4)$$

$$11) 4x^3 - x^2 - 4x + 1$$

$$(4x - 1)(x + 1)(x - 1)$$

$$12) 4x^8 - 61x^4 + 225$$

$$(2x^2 + 5)(2x^2 - 5)(x^2 + 3)(x^2 - 3)$$

$$13) 5x^2 + 24x - 5$$

$$(5x - 1)(x + 5)$$

$$14) 5x^2 + 29x + 20$$

$$(5x + 4)(x + 5)$$

$$15) 4x^2 + 4x - 15$$

$$(2x - 3)(2x + 5)$$

$$16) 10x^3 - 8x^2 + 25x - 20$$

$$(5x - 4)(2x^2 + 5)$$

$$17) 27x^9 + x^6 - 27x^3 - 1$$

$$(3x + 1)(9x^2 - 3x + 1)(x + 1)(x^2 - x + 1)(x - 1)(x^2 + x + 1)$$

$$18) 8x^4 + 10x^2 - 3 \quad (2x + 1)(2x - 1)(2x^2 + 3)$$